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**ENGINEERING FIELD ACTIVITY WEST
NAVAL FACILITIES ENGINEERING COMMAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA**

**FORMERLY USED DEFENSE SITES (FUDS)
FIELD SAMPLING PLAN**

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CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
1.1 FACILITY BACKGROUND	1
1.2 FORMERLY USED DEFENSE SITES BACKGROUND	3
1.3 PURPOSE	4
2.0 TECHNICAL APPROACH TO SAMPLING AND TESTING	4
2.1 INVESTIGATION OBJECTIVES	4
2.2 SOIL AND HYDROPUNCH SAMPLING APPROACH	5
2.3 GROUNDWATER MONITORING AND GROUNDWATER SAMPLING APPROACH	5
2.4 AQUIFER TESTING APPROACH	6
3.0 GENERAL SAMPLING PROGRAM	7
3.1 FIELD ACTIVITIES	7
3.2 SAMPLING ANALYSIS	8
4.0 SITE-SPECIFIC SAMPLING PROGRAMS	9
4.1 SI-74 BUILDING 815	9
4.2 SI-75 BUILDING 820	9
4.3 IR-76 BUILDING 830 AND 831	10
5.0 HEALTH AND SAFETY	10
REFERENCES	11

TABLES

Table

- 1 **Planned Drilling and Sampling Program**
- 2 **Physical Testing - Unsaturated Zone Soil Samples**
- 3 **Field Identification Numbers for Soil Samples and Analytical Program**
- 4 **Field Identification Numbers for Groundwater Samples and Analytical Program**
- 5 **Field QA/QC Sampling**

FIGURES

Figure

- 1 **Facility Location Map**
- 2 **Installation Restoration Sites Location Map**
- 3 **Parcel E Formerly Used Defense Site SI-74 Building 815**
- 4 **Parcel E Formerly Used Defense Site SI-75 Building 820**
- 5 **Parcel E Formerly Used Defense Site IR-74 Buildings 830 and 831**

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) received Contract Task Order (CTO) Number (No.) 005 (dated April 14, 1995, revised April 19, 1995) under the CLEAN II contract from the Department of the Navy, Engineering Field Activity West (EFA WEST), Naval Facilities Engineering Command to implement Parcels D and E Remedial Investigation (RI) through Record of Decision (ROD) at the Hunters Point Annex (HPA), San Francisco, California (Figure 1). One of the objectives of CTO No. 005 is to create and implement a field work plan, sampling and analysis plan, and quality assurance project plan (QAPjP) for the investigation of the formerly used defense sites (FUDS). The FUDS are located adjacent to Parcel E along Crisp Avenue (Figure 2).

This field sampling plan (FSP) presents PRC's technical approach, for the field work plan and sampling and analysis plan for the investigation of the FUDS. The HPA Basewide QAPjP which was revised in 1995 (PRC 1995b) covers all the types of field and sampling activities to be conducted at the FUDS. A specific QAPjP for the FUDS will not be prepared. Task 2 of the work plan for CTO No. 005 described the assumptions and general description of the field and sampling activities to be conducted at the FUDS. The PRC team for this project will consist of PRC and CLEAN II team firms (Levine-Fricke and Uribe and Associates). Field sampling will begin after the Navy receives clearance from the FUDS property owners to sample.

1.1 FACILITY BACKGROUND

HPA is in southeast San Francisco on a peninsula and extends east into San Francisco Bay (Figure 1). The Navy property comprises approximately 936 acres, of which approximately 493 acres is on land and the rest is in San Francisco Bay. HPA is bounded on the north and east by San Francisco Bay and on the south and west by the Hunters Point district of San Francisco which consists of public and private housing and commercial and industrial buildings.

HPA operated as a commercial drydock facility from 1869 until December 29, 1939, when the property was purchased by the Navy from Bethlehem Steel Company. The Navy modified, maintained, and repaired boats and ships at the facility. HPA was also used for personnel training, limited radiological operations, research and development, ship design, and nonindustrial services for

Navy personnel and their families. In 1975, the Navy ceased shipyard operations, placed the facility in industrial reserve, and transferred control to its Office of the Supervisor of Shipbuilding Conversion and Repair, San Francisco.

Between 1935 and 1975, fill materials were placed in San Francisco Bay, increasing the land area of the facility from less than 100 acres to approximately 500 acres. Filling throughout HPA appeared to be complete by 1975. Aerial photographs indicate that extensive cut-and-fill operations took place sometime between 1935 and 1948. Although documentation of the cut-and-fill operations is not known to exist, review of aerial photographs from the 1940s indicates that most of the cutting and filling occurred soon after the Navy took possession of the property in late 1941 to late 1943.

Based on the results of soil and groundwater investigations performed between 1986 and 1988 in support of the plan to homeport the battleship Missouri at HPA, HPA was placed on the National Priorities List (NPL) in 1989. As a result, the Navy is required to perform a remedial investigation/feasibility study (RI/FS) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). In 1989, RI/FS activities for 20 IR sites at HPA were initiated under the Navy's Installation Restoration (IR) Program.

In 1990, the U.S. Department of Defense placed HPA on the Base Closure List, mandating that HPA be remediated and made available for nondefense use. HPA was designed as a "B" site by the Agency for Toxic Substances and Disease Registry in 1991, meaning it poses no imminent threat to human health but has the potential to pose a long-term threat to human health.

The 20 sites were divided into five operable units (OU), as defined in the Federal Facilities Agreement (FFA) signed January 22, 1992, by the Navy, the U.S. Environmental Protection Agency (EPA), and the State of California Department of Toxic Substances Control (DTSC), and Regional Water Quality Control Board (RWQCB).

In late 1992, the Navy proposed a new approach for the RI/FS program by which the HPA facility would be divided into five parcels (A through E) to expedite remedial action and land reuse. An accelerated investigation was subsequently conducted for Parcel A to hasten reuse.

1.2

FORMERLY USED DEFENSE SITES BACKGROUND

The FUDS properties are located adjacent to HPA Parcels A and E, along Crisp Avenue (Figure 2). The FUDS are buildings or land formerly owned and used by the Navy, that have been transferred to non-military or federal owners. There are three FUDS; SI-74 (Building 815, consisting of about 4.2 acres); SI-75 (Building 820, with about 3.8 acres); and IR-76 (Buildings 830 and 831, consists of about 6.2 acres) (Figures 3, 4, and 5, respectively). Buildings 815, 820, 830, and 831 were former Naval Radiological Defense Laboratory (NRDL) sites. All of these buildings have been cleared by the Atomic Energy Commission (AEC) or its successor the Nuclear Regulatory Commission (NRC) for possible radiological contamination, and the surrounding area will receive further radiological investigation if records of previous use indicate further investigation is warranted. Any further radiological investigation will be proposed in the NRDL sites work plan to be prepared under CTO 285 and submitted to the regulatory agencies in December 1995.

Four underground storage tanks (UST) have been reported at SI-74, Building 815 (Freitas 1994). These four USTs were associated with a former gasoline station that operated during the 1950s and was located within the foot print of Building 815. The current status of these four USTs is unknown. Additionally, the industrial landfill (IR-01) may extend beneath SI-75, in portions of the area surrounding Building 820 and portions of IR-76, Buildings 830 and 831. The Navy transferred property at SI-74 to Ted Lowpensky, on December 12, 1984 (Figure 3). Building 815 is currently leased to the Filesafe Company for file storage. SI-75 was transferred to Ted Lowpensky on July 17, 1981 (Figure 4). Building 820 is currently being used as a wood molding shop. IR-76 was transferred to the University of California at San Francisco on April 17, 1978 (Figure 5). Buildings 830 and 831 are currently being used as kennels.

A preliminary environmental investigation at IR-76 was conducted on March 15, 1989 (HLA 1989), including the collection of soil and water samples in the area adjacent to the industrial landfill (IR-01). The purpose of the sampling was to evaluate if the landfill (IR-01) and associated contamination extended under IR-76. Sampling consisted of four soil samples and one grab groundwater sample from one boring (01UC01) and one surface water sample (UCSW). Based on the absence of rubbish and the low amounts of concrete rubble encountered in boring 01UC01, it does not appear that this

boring was drilled through part of the industrial landfill. Results of the chemical analyses of the four soil samples and the groundwater sample indicate the presence of volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, total petroleum hydrocarbons (TPH) as gasoline and diesel, oil and grease, and metals. The VOC and SVOC appear to be primarily fuel related (HLA 1989). The recommendation of the preliminary investigation was to collect additional information to evaluate the extent of the industrial landfill and the presence of chemicals in soil and groundwater. The surface water sample contained low levels of organic compounds and asbestos structures. During the title search for the basewide environmental baseline survey (EBS) a note on a Sanborn Map indicated the location of a possible UST in the western portion of IR-76 (Sanborn 1950). The UST is reported on the map to have contained fuel oil and had a capacity of approximately 5,000 gallons. The current status of the suspected UST is unknown.

1.3 PURPOSE

The purpose of this FSP is to present the approach to field work and data analysis required for investigating the three FUDS for possible chemical contamination. Radiological contamination is not considered in this FSP, except in the case of screening for health and safety purposes during field activities. The information collected during the FUDS investigation will be included in the Parcel E RI report.

2.0 TECHNICAL APPROACH TO SAMPLING AND TESTING

This section describes the objectives and the conceptual approach for the investigations of the FUDS (SI-74, SI-75, and IR-76). Specifically, this section describes the investigation objectives and the conceptual approaches to sampling of soil, groundwater monitoring and sampling, aquifer testing, and land surveying.

2.1 INVESTIGATION OBJECTIVES

The objectives of the investigations at each of the FUDS are to:

- Identify the chemicals that may be present in soil and/or groundwater

- Characterize the sources as well as the vertical and lateral extent of the chemicals identified
- Characterize potential chemical migration pathways
- Evaluate groundwater quality and flow conditions
- Obtain data required for groundwater and chemical transport modeling, if necessary
- Provide data needed to assess the risk to human health and the environment, and
- Provide data for the evaluation and design of remedial measures, if necessary.

2.2 SOIL AND HYDROPUNCH SAMPLING APPROACH

Soil and hydropunch sampling from soil borings are proposed at each of the FUDS to provide data on the lateral and vertical distribution of chemicals in the soil and groundwater. The chemical data will be used to evaluate potential chemical transport from soils to underlying groundwater. Soil borings will be located in areas of possible contamination.

Five soil samples will be collected from each of the soil borings from surface, and approximately 5 feet, 10 feet, 15 feet, and 20 feet below ground surface (bgs). One hydropunch water sample will be collected from each of the soil borings. The hydropunch water samples will be analyzed on a 48-hour turnaround time to facilitate the timely placement of the monitoring wells.

2.3 GROUNDWATER MONITORING AND GROUNDWATER SAMPLING APPROACH

Groundwater monitoring wells are proposed to be installed at each of the FUDS to provide data regarding the direction of groundwater flow, the chemical quality of the groundwater, and the hydraulic characteristics of aquifer materials. Four monitoring wells are planned for installation at the three FUDS. The well locations will be selected at each FUDS, where possible, so that the wells can be used in conjunction with monitoring wells from adjacent sites to better evaluate local groundwater flow directions and gradients. The monitoring wells will be installed in the first aquifer encountered, either the A-aquifer or the bedrock aquifer. The analytical results of the hydropunch groundwater samples will be used to help in the timely placement the monitoring wells. Three rounds of groundwater sampling and water level measurements will be collected from each of the monitoring

wells installed at the FUDS. The first round of groundwater samples will be collected immediately after the wells are developed. The second and third rounds will be collected approximately 90 and 180 days after the first round of groundwater sampling, respectively.

2.4 AQUIFER TESTING APPROACH

To estimate the hydraulic properties of aquifer materials (i.e., aquifer transmissivity, hydraulic conductivity, and storativity for the FUDS), aquifer tests will be performed on selected monitoring wells. The monitoring wells will be installed in the first aquifer encountered, either the A-aquifer or the bedrock aquifer. Slug tests are planned for each of the four monitoring wells installed at the FUDS. Constant-rate pumping tests will be conducted at two of the monitoring wells installed at the FUDS. Slug test results and analytical data will be used in selecting the wells for the two constant-rate pumping tests. Water-level drawdown and recovery data from the constant-rate discharge tests will be used to estimate transmissivity, hydraulic conductivity, and storativity.

Well Selection Criteria for Constant-Rate Discharge Testing

Monitoring wells to be pumped for constant-rate discharge testing will be selected on the basis of the following criteria:

- Wells screened in the uppermost, undifferentiated, and bedrock aquifer zones
- Wells having at least 10 feet of available drawdown in the well casing
- Wells that do not contain free product, and
- Wells screened in correlative lithologic zones having hydraulic conductivities greater than 10^{-5} cm/second as estimated from slug testing.

Up to eight piezometers will be installed as observation wells for the two constant-rate discharge tests. The piezometers will be installed within the expected radius of influence of each selected pumping well. The volume of groundwater evacuated from the monitoring wells during the constant-rate pumping test is based on a total of 2 tests, and a pumping duration of approximately 24 hours at a rate of approximately 5 gallons per minute for each test.

3.0 GENERAL SAMPLING PROGRAM

This section describes the general sampling for the investigations at the three FUDS. This sampling program is based on existing data.

3.1 FIELD ACTIVITIES

Table 1 summarizes the field activities to be performed at the FUDS. Specific field activities to be performed at the three FUDS include:

- Perform geophysical surveys to clear all soil boring, piezometer, and monitoring well locations.
- Perform geophysical survey to locate a suspected UST in the western portion of IR-76.
- Core concrete as needed at 30 boring locations.
- Drill 18 hydropunch borings to approximately 20 feet bgs. Collect five soil samples and one water sample for chemical analyses from each hydropunch boring.
- Install and develop four monitoring wells based on hydropunch borings.
- Drill, install, and develop eight piezometers.
- Collect three groundwater samples for chemical analyses from each new monitoring well. The first groundwater samples will be collected immediately after well development. The second and third rounds will be collected approximately 90 and 180 days thereafter, respectively. This sampling schedule may be revised based on discussions between the Navy and the regulatory agencies regarding the FFA schedule.
- Monitor groundwater levels at each new monitoring well for two rounds after the initial sampling event.
- Perform a slug test at each of the four newly installed wells.
- Perform two constant-rate discharge aquifer tests on newly installed wells, and conduct tidal influence monitoring during each aquifer test.
- Survey borings, piezometers, and monitoring wells for elevation and horizontal coordinate locations.

- Coordinate locations will be surveyed and referenced to the California State Plan Coordinate System to an accuracy of plus or minus 1 foot. Boring and monitoring well ground surface elevations will be surveyed to an accuracy of 0.1 foot and referenced to the 1929 Mean Sea Level, National Geologic Vertical Datum (1958 adjustment). Monitoring well top-of-casing elevations will be surveyed to an accuracy of 0.01 foot.
- Review of field notes by a field coordinator and boring logs by a California-registered geologist will be performed.
- Collect and analyze three soil samples for physical characteristics (Table 2) including: grain size, total porosity, moisture content, dry bulk density, wet bulk density, and total organic carbon.

These field activities will be conducted as generally described in the HPA Basewide QAPjP (PRC 1995b) and the HPA Site Safety Plan (PRC 1995a). Field procedures, decontamination procedures, and quality assurance/quality control (QA/QC) procedures are described in the HPA Basewide QAPjP (PRC 1995b).

3.2 SAMPLING ANALYSIS

All laboratory analyses will be performed by a laboratory certified by the State of California and by the Navy for the analyses requested. The analytical program for soil, hydropunch, and groundwater samples at the FUDS is based on the chemicals detected in previous investigations conducted in the vicinity of the FUDS as well as chemicals likely to have been stored or used at the sites. Because of the variety of chemicals potentially present, soil and groundwater samples submitted to the analytical laboratory during the investigations will be analyzed for the full suite of analyses (Tables 3 and 4, respectively). The methodologies to be followed on the analyses of the samples are the EPA Contract Laboratory Program (CLP), or the PRC statement of work for laboratory analysis (PRC 1995b) where applicable. The hydropunch water samples will be analyzed for TPH as gasoline, diesel, and motor oil, and SW-846 halogenated and aromatic volatile organic compounds by Method 8010/8020 on a 48-hour turnaround time.

In addition, soil samples collected from the upper 5 feet in borings will be analyzed for asbestos. Soil samples will also be screened for beta and gamma radiation, for health and safety.

In addition, groundwater samples will be analyzed for anions including sulfate, nitrate, and chloride, and for total dissolved solids (TDS). Total alkalinity, pH, electrical conductivity, and turbidity will be determined in the field. Table 5 summarizes the quality control/quality assurance (QA/QC) samples to be collected for the FUDS investigation.

4.0 SITE-SPECIFIC SAMPLING PROGRAMS

4.1 SI-74 BUILDING 815

Five soil borings are planned for SI-74 to investigate the four underground storage tanks that have been reported at Building 815 (Freitas 1994). The current status of these four USTs is unknown. One surface soil sample and four subsurface soil samples will be collected from each of the five borings. One hydropunch water sample will be collected from each of the five borings. The locations of the five proposed borings are shown on Figure 3. One monitoring well will be installed and three rounds of groundwater samples will be collected. The monitoring well will be installed in the bedrock aquifer. The specific analyses to be performed on each soil sample are listed in Table 3. The specific analyses to be performed on hydropunch and groundwater samples are listed in Table 4.

4.2 SI-75 BUILDING 820

Three soil borings are planned for the SI-75 to investigate the extent of the industrial landfill (IR-01) which may extend beneath Building 820. One surface soil sample and four subsurface soil samples will be collected from each of the three borings. One hydropunch sample will be collected from each of the three borings. The locations of the three proposed borings are shown on Figure 4. One monitoring well will be installed and three rounds of groundwater samples will be collected. The monitoring well will be installed in the A-aquifer. The specific analyses to be performed on each soil sample are listed in Table 3. The specific analyses to be performed on hydropunch and groundwater samples are listed in Table 4.

4.3 IR-76 BUILDINGS 830 AND 831

Ten soil borings are planned for IR-76 to investigate the extent of the industrial landfill (IR-01) which may extend beneath Buildings 830 and 831. Additionally, the suspected UST located in the western portion of IR-76 will be investigated (Sanborn 1950). The current status of the suspected UST is unknown. A geophysical survey will be conducted to locate the suspected UST. If the tank is located, a boring will be placed downgradient of the UST to evaluate if there has been a release to the environment. One surface soil sample and four subsurface soil samples will be collected from each of the ten borings. One hydropunch sample will be collected from each of the ten borings. The locations of the ten proposed borings are shown on Figure 5. Two monitoring wells will be installed and three rounds of groundwater samples will be collected. The monitoring wells will be installed in the A-aquifer. The specific analyses to be performed on each soil sample are listed in Table 3. The specific analyses to be performed on hydropunch and groundwater samples are listed in Table 4.

5.0 HEALTH AND SAFETY

All work on this project will be performed in accordance with PRC's Draft Navy CLEAN II Health and Safety Program (PRC 1995a) and PRC's Navy CLEAN Draft Ionizing Radiation Program (PRC 1993). Because field work will require intrusive activities, site-specific health and safety plans have been prepared.

REFERENCES

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- PRC Environmental Management, Inc. (PRC). 1993. "Navy CLEAN Draft Ionizing Radiation Protection Program." April.
- PRC. 1995a. "Navy Clean II Health and Safety Program." April.
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- Sanborn Map Company. 1950. Map of San Francisco, California. 1913-1923 corrected to 1950.

TABLES

TABLE 1
PLANNED DRILLING AND SAMPLING PROGRAM
FORMERLY USED DEFENSE SITES

ACTIVITY	QUANTITY
Number of Hydropunch Borings:	18
Average Depth (Feet):	20
Total Drilling Footage:	360
Average Soil Samples Per Boring:	5
Total Surface Soil Samples	18
Total Subsurface Soil Samples	72
Total Hydropunch Water Samples	18
 Number of Wells	 4
Average Depth (Feet):	20
Total Drilling Footage (Feet):	80
Average Soil Samples Per Well:	0
 Number of Piezometers:	 8
Average Depth (Feet):	20
Total Drilling Footage (Feet):	160
Average Soil Samples Per Boring:	0
 Concrete Corings (2 Feet deep):	 30
 Survey Points:	 30
 Locations for Geophysical Clearance:	 30
Feet of Other Geophys. Investigation:	540
 Slug Tests:	 4
Aquifer Test (constant-rate pumping):	2

TABLE 2
PHYSICAL TESTING OF
UNSATURATED ZONE SOIL SAMPLES
FORMERLY USED DEFENSE SITES

Proposed Analysis	Quantity
Grain Size	3
Porosity	3
Moisture Content	3
Dry Bulk Density	3
Wet Bulk Density	3
Total Organic Carbon	3

TABLE 3

**FIELD IDENTIFICATION NUMBERS FOR
SOIL SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES**

Site No.	Field ID	Depth (ft) bgs	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	Asbestos
SI-74	SI74B001	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	SI74B002	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	SI74B003	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
SI-74	SI74B004	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	

TABLE 3

**FIELD IDENTIFICATION NUMBERS FOR
SOIL SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES
(continued)**

Site No.	Field ID	Depth (ft) bgs	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	Asbestos
SI-74	SI74B004	20	Soil	X	X	X	X	X	X	X	X	
	SI74B005	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
SI-75	SI75B001	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	SI75B002	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	SI75B003	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X

TABLE 3

**FIELD IDENTIFICATION NUMBERS FOR
SOIL SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES
(continued)**

Site No.	Field ID	Depth (ft) bgs	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	Asbestos
SI-75	SI75B003	10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
IR-76	IR76B001	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B002	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B003	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	

TABLE 3

**FIELD IDENTIFICATION NUMBERS FOR
SOIL SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITE
(continued)**

Site No.	Field ID	Depth (ft) bgs	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	Asbestos
IR-76	IR76B004	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B005	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B006	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B007	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	

TABLE 3

**FIELD IDENTIFICATION NUMBERS FOR
SOIL SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITE
(continued)**

Site No.	Field ID	Depth (ft) bgs	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	Asbestos
IR-76	IR76B007	15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B008	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
	IR76B009	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	

TABLE 3

**FIELD IDENTIFICATION NUMBERS FOR
SOIL SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITE
(continued)**

Site No.	Field ID	Depth (ft) bgs	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	Asbestos
IR-76	IR76B010	0.0	Soil		X	X	X	X	X	X	X	X
		5.0	Soil	X	X	X	X	X	X	X	X	X
		10	Soil	X	X	X	X	X	X	X	X	
		15	Soil	X	X	X	X	X	X	X	X	
		20	Soil	X	X	X	X	X	X	X	X	
Total number of analyses				72	90	90	90	90	90	90	36	

Notes:

CLP - Contract Laboratory Program

VOC - Volatile Organic Compounds

SVOC - Semivolatile Organic Compounds

PCB - Polychlorinated Biphenyls

Pest - Pesticides (organochlorine)

TPH - Total Petroleum Hydrocarbons as gasoline, diesel, and motor oil

TRPH - Total Recoverable Petroleum Hydrocarbons

TABLE 4

**FIELD IDENTIFICATION NUMBERS FOR
GROUNDWATER SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES**

Site No.	Field ID	Round	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	SW-846 8010/8020
SI-74	SI74B001	NA	Grab water				X	X	X			X
	SI74B002	NA	Grab water				X	X	X			X
	SI74B003	NA	Grab water				X	X	X			X
	SI74B004	NA	Grab water				X	X	X			X
	SI74B005	NA	Grab water				X	X	X			X
	SI74MW01	1	Ground water	X	X	X	X	X	X	X	X	
	SI74MW01	2	Ground water	X	X	X	X	X	X	X	X	
	SI74MW01	3	Ground water	X	X	X	X	X	X	X	X	
SI-75	SI75B001	NA	Grab water				X	X	X			X
	SI75B002	NA	Grab water				X	X	X			X
	SI75B003	NA	Grab water				X	X	X			X

TABLE 4
FIELD IDENTIFICATION NUMBERS FOR
GROUNDWATER SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES
(continued)

Site No.	Field ID	Round	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	SW-846 8010/8020
SI-75	SI75MW01	1	Ground water	X	X	X	X	X	X	X	X	
	SI75MW01	2	Ground water	X	X	X	X	X	X	X	X	
	SI75MW01	3	Ground water	X	X	X	X	X	X	X	X	
IR-76	IR76B001	NA	Grab water				X	X	X			X
	IR76B002	NA	Grab water				X	X	X			X
	IR76B003	NA	Grab water				X	X	X			X
	IR76B004	NA	Grab water				X	X	X			X
	IR76B005	NA	Grab water				X	X	X			X

TABLE 4

**FIELD IDENTIFICATION NUMBERS FOR
GROUNDWATER SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES
(continued)**

Site No.	Field ID	Round	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	SW-846 8010/8020
IR-76	IR76B006	NA	Grab water				X	X	X			X
	IR76B007	NA	Grab water				X	X	X			X
	IR76B008	NA	Grab water				X	X	X			X
	IR76B009	NA	Grab water				X	X	X			X
	IR76B010	NA	Grab water				X	X	X			X
	IR76MW01	1	Ground water	X	X	X	X	X	X	X	X	
	IR76MW01	2	Ground water	X	X	X	X	X	X	X	X	
	IR76MW01	3	Ground water	X	X	X	X	X	X	X	X	
	IR76MW02	1	Ground water	X	X	X	X	X	X	X	X	

TABLE 4

**FIELD IDENTIFICATION NUMBERS FOR
GROUNDWATER SAMPLES AND ANALYTICAL PROGRAM
FORMERLY USED DEFENSE SITES
(continued)**

Site No.	Field ID	Round	Media	CLP VOC	CLP SVOC	CLP PCB/Pest	TPH-g	TPH-d	TPH-mo	TRPH	CLP Metals	SW-846 8010/8020
IR-76	IR76MW02	2	Ground water	X	X	X	X	X	X	X	X	
	IR76MW02	3	Ground water	X	X	X	X	X	X	X	X	
Total number of analyses				12	12	12	30	30	30	12	12	18

Notes:

CLP - Contract Laboratory Program
 VOC - Volatile Organic Compounds
 SVOC - Semivolatile Organic Compounds
 PCB - Polychlorinated Biphenyls
 Pest - Pesticides (organochlorine)
 TPH - Total Petroleum Hydrocarbons as gasoline, diesel, and motor oil
 TRPH - Total Recoverable Petroleum Hydrocarbons
 SW-846 8010 - Halogenated Volatile Organic Compounds
 SW-846 8020 - Aromatic Volatile Organic Compounds
 NA - Not Applicable
 Grab Water - Hydropunch Water Sample

TABLE 5
FIELD QA/QC SAMPLING
FORMERLY USED DEFENSE SITES

Proposed Analysis	Equipment Blanks	Duplicates	Field Blanks	Trip Blanks
CLP VOC	9	1	9	3
SW-846 8010	6	1	9	6
SW-846 8020	6	1	9	6
CLP SVOC	9	1	9	
CLP PCB/Pesticides	9	1	9	
CLP Metals	9	1	9	
TPH as Gasoline	9	1	9	
TPH as Diesel	9	1	9	
TPH as Motor Oil	9	1	9	
TRPH	9	1	9	

Notes:

Equipment blanks are based on ten percent of all samples taken (from Tables 3 and 4)

Duplicates are based on five percent of groundwater samples taken (from Tables 3 and 4)

Field blanks are based on ten percent of all samples taken (from Tables 3 and 4)

Trip blanks are based on 30 percent of all water samples taken (from Tables 3 and 4)

CLP - Contract Laboratory Program

VOC - Volatile Organic Compounds

SVOC - Semivolatile Organic Compounds

PCB - Polychlorinated Biphenyls

Pest - Pesticides (organochlorine)

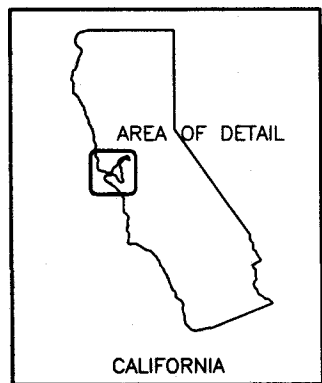
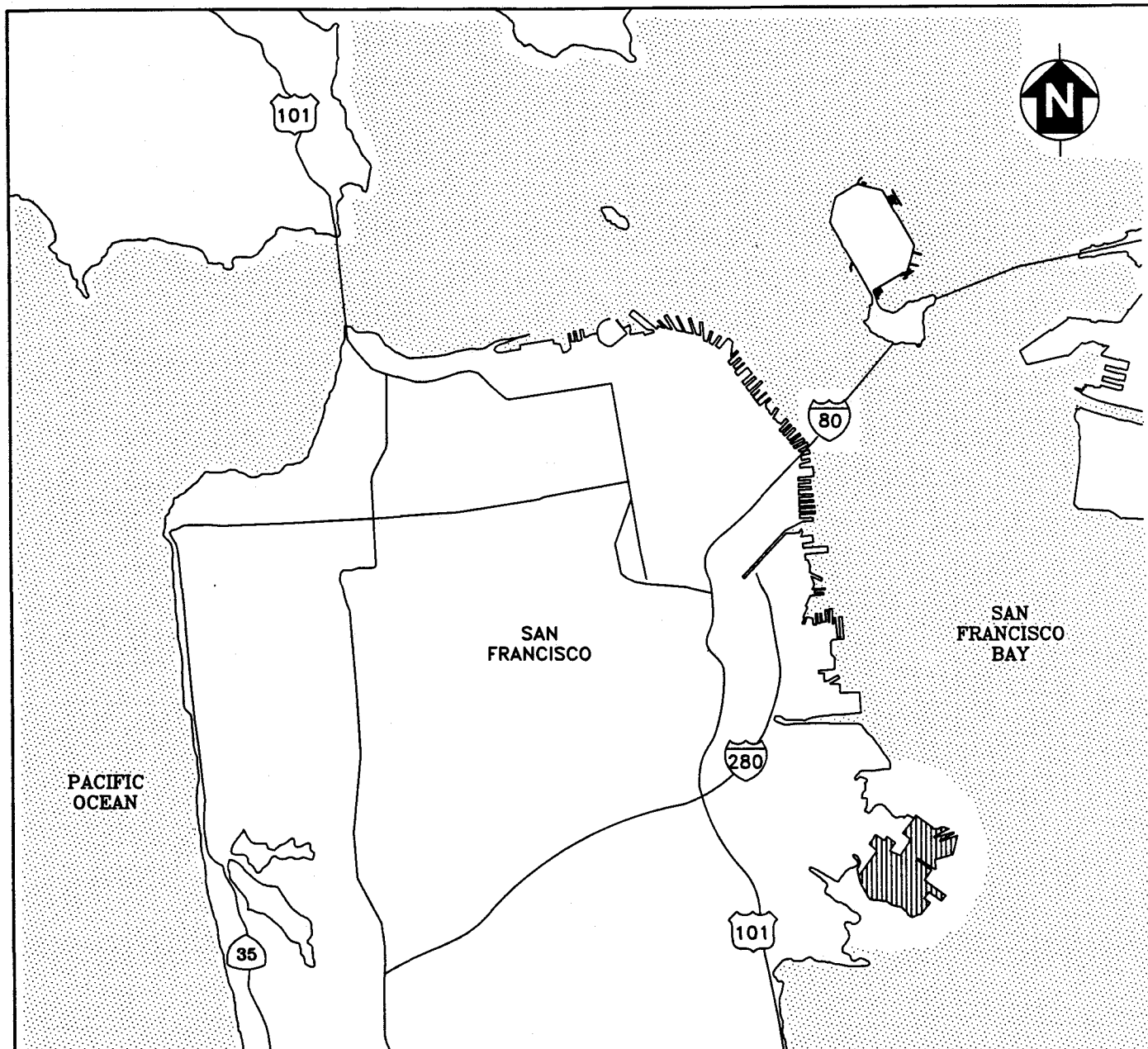
TPH - Total Petroleum Hydrocarbons as gasoline, diesel, and motor oil

TRPH - Total Recoverable Petroleum Hydrocarbon

SW-846 8010 - Halogenated Volatile Organic Compounds (only for hydropunch sampling)

SW-846 8020 - Aromatic Volatile Organic Compounds (only for hydropunch sampling)

FIGURES



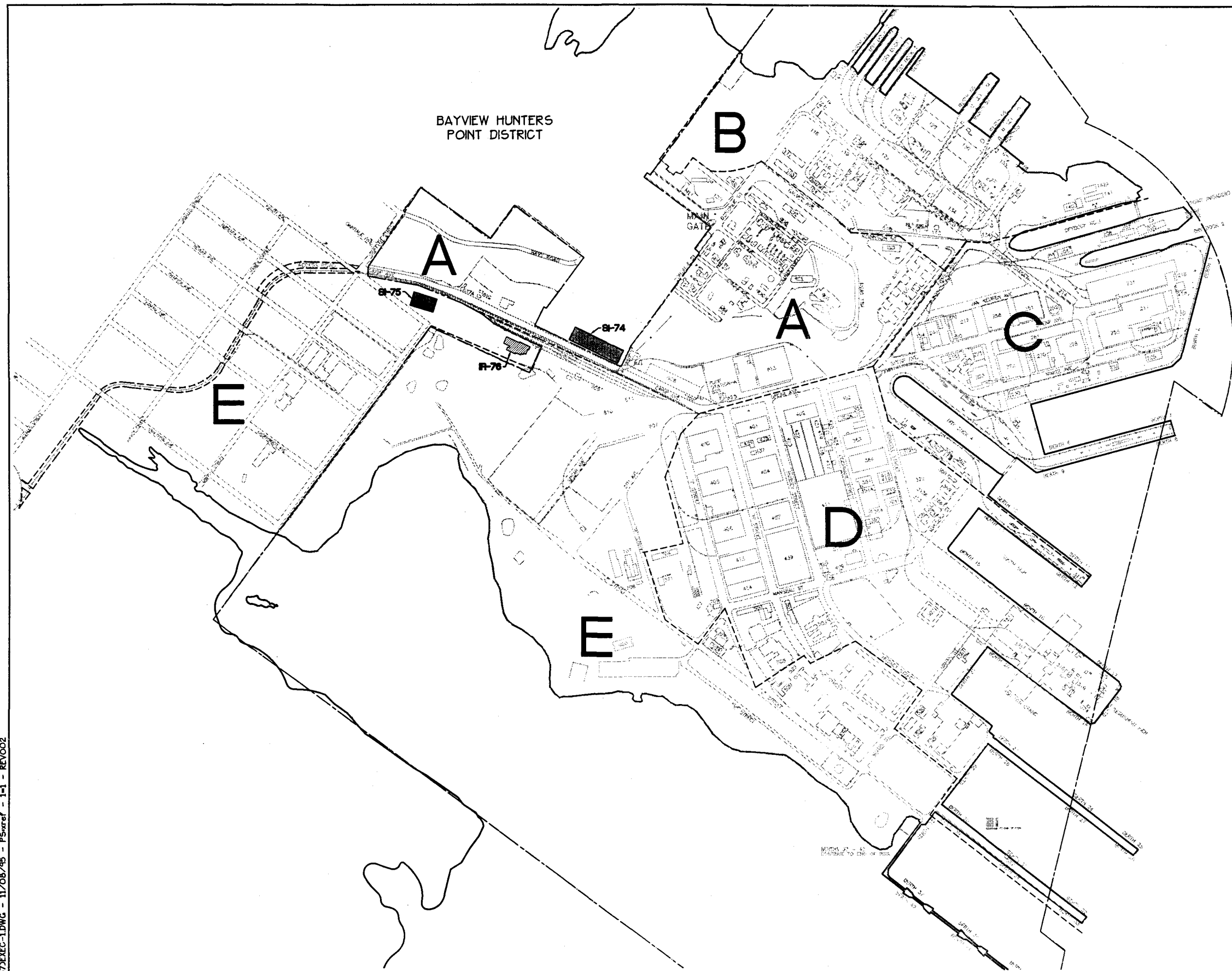
HUNTERS POINT ANNEX

1.5 0 1.5 3
SCALE: 1" = 3 MILES

HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

FIGURE 1
FACILITY
LOCATION MAP



PMC ENVIRONMENTAL MANAGEMENT, INC.

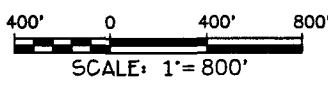


BAYVIEW HUNTERS
POINT DISTRICT

SAN FRANCISCO
BAY

Legend

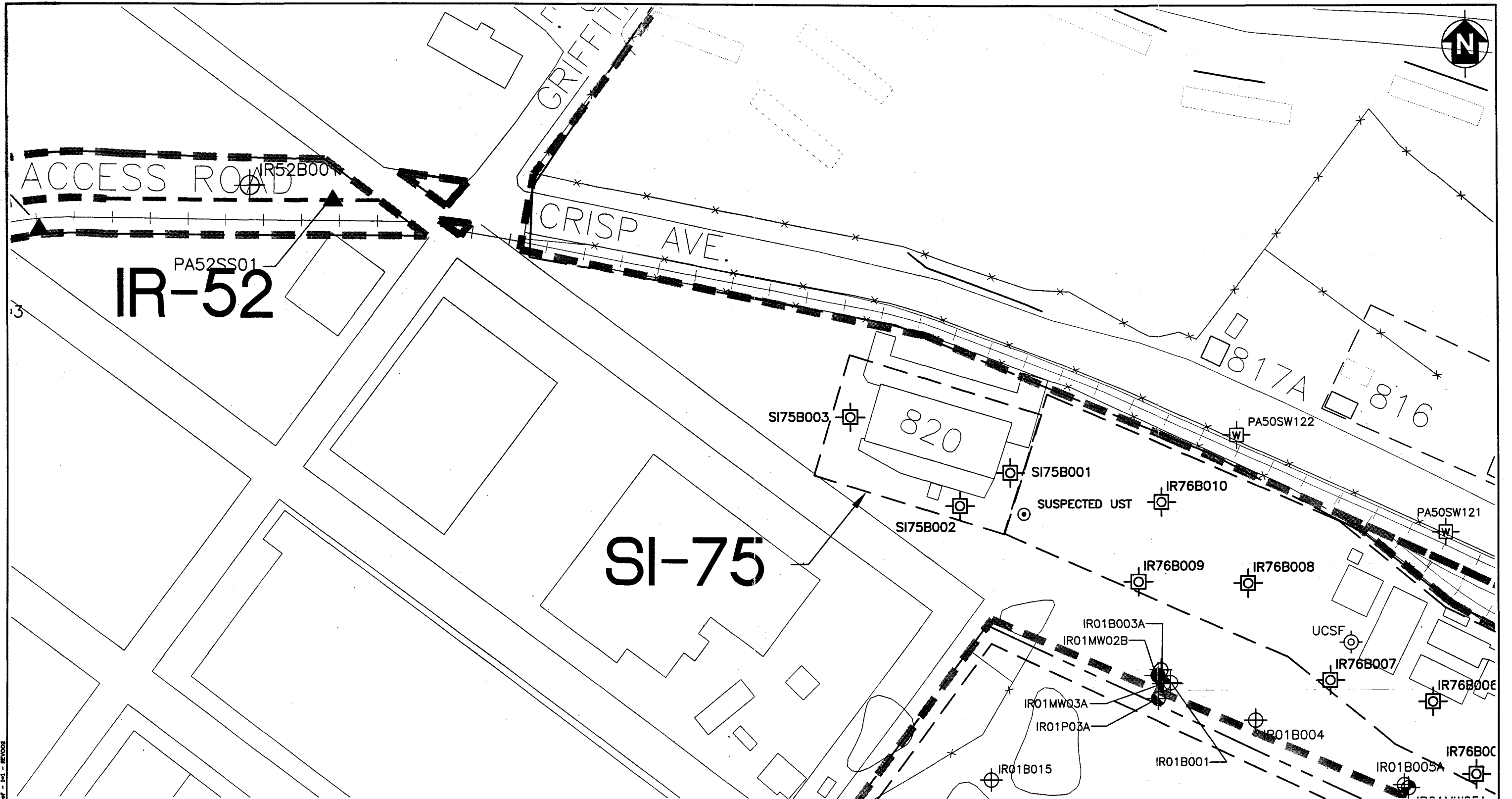
----	PARCEL BOUNDARY		IR SITE		SI SITE
------	-----------------	---	---------	---	---------



NOTE: PARCEL F IS OFFSHORE AREA OF HPA

HUNTERS POINT ANNEX SAN FRANCISCO, CALIFORNIA
FIGURE 2 HUNTERS POINT ANNEX PARCEL LOCATION MAP
PRC ENVIRONMENTAL MANAGEMENT, INC.

KCH/SF/X044-0287/EXEC-1.DWG - 11/08/95 - P5wref - 1-1 - REV002



K00570044-028701.DWG - 11/30/95 - P10000 - 141 - REV002

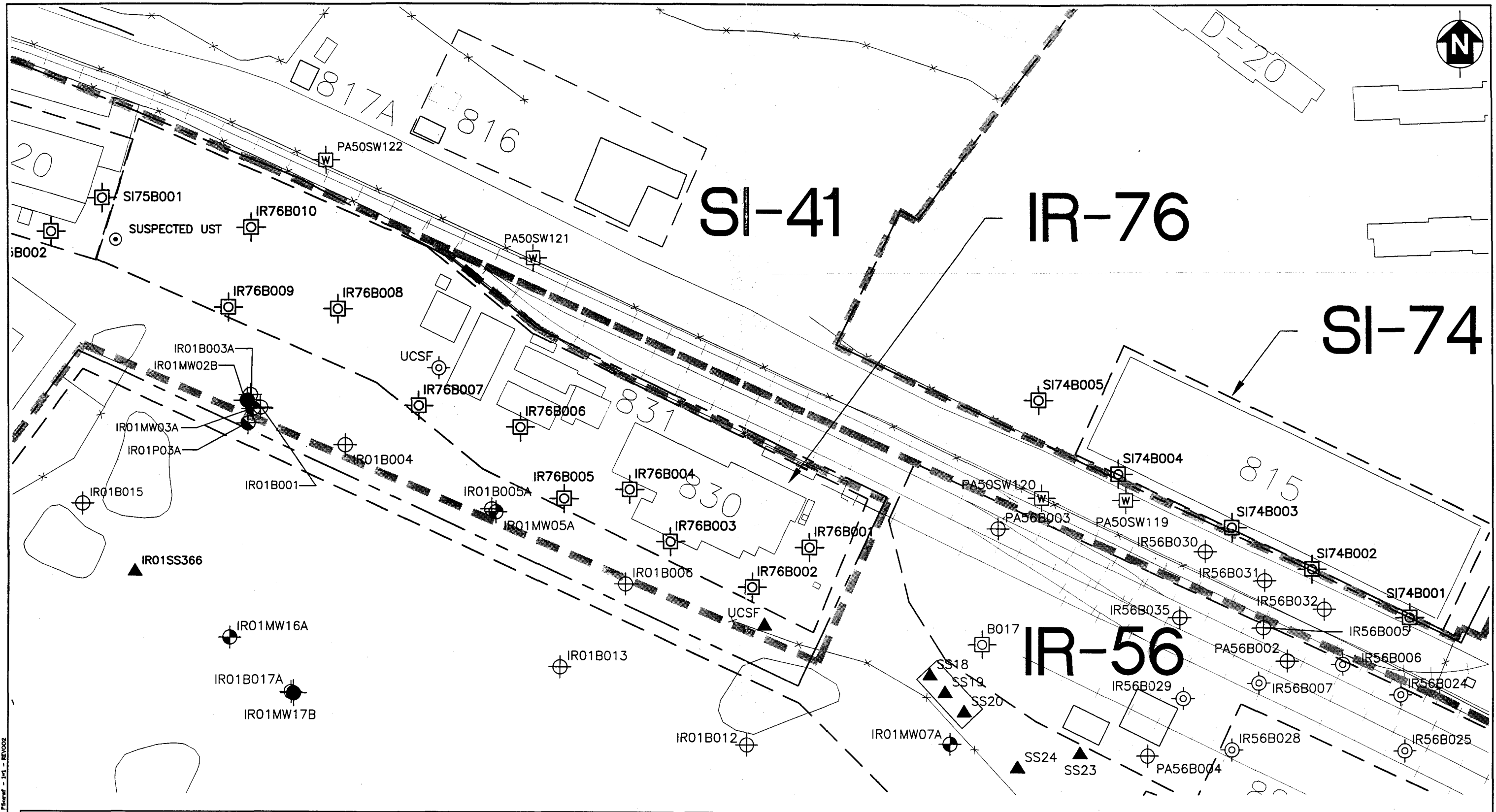
Legend		PROPOSED RI SAMPLING LOCATIONS		PREVIOUS RI AND SI SAMPLING LOCATIONS	
	EXISTING BUILDING		SOIL BORING/HYDROPUNCH		SOIL BORING
	FORMER BUILDING		SURFACE SOIL SAMPLE FOR PREVIOUS INVESTIGATION UNIVERSITY OF CALIFORNIA AT SAN FRANCISCO		SOIL BORING/HYDROPUNCH
	FACILITY BOUNDARY		UCSF		A-AQUIFER MONITORING WELL
	PARCEL BOUNDARY		SUSPECTED UNDERGROUND STORAGE TANK (UST)		B-AQUIFER MONITORING WELL
	RETAINING WALL				BEDROCK MONITORING WELL
	FENCELINE				PIEZOMETERS
					SURFACE SOIL SAMPLE
					STORM DRAIN



HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

FIGURE 4
PARCEL E
FORMERLY USED DEFENSE SITE
SI-75 BUILDING 820

PRC ENVIRONMENTAL MANAGEMENT, INC.



Legend		PROPOSED RI SAMPLING LOCATIONS		PREVIOUS RI AND SI SAMPLING LOCATIONS	
	EXISTING BUILDING		SOIL BORING/HYDROPUNCH		SOIL BORING
	FORMER BUILDING		UCSF SURFACE SOIL SAMPLE FOR PREVIOUS INVESTIGATION UNIVERSITY OF CALIFORNIA AT SAN FRANCISCO		SOIL BORING/HYDROPUNCH
	FACILITY BOUNDARY				A-AQUIFER MONITORING WELL
	PARCEL BOUNDARY				B-AQUIFER MONITORING WELL
	RETAINING WALL				BEDROCK MONITORING WELL
	FENCELINE				PIEZOMETERS
	SUSPECTED UNDERGROUND STORAGE TANK (UST)				SURFACE SOIL SAMPLE
					STORM DRAIN



HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

FIGURE 5
PARCEL E
FORMERLY USED DEFENSE SITE
IR-76 BUILDINGS 830 and 831

PRC ENVIRONMENTAL MANAGEMENT, INC.

K:\SF\044-0287\BUILTING - 11.30.09 - Final - 14 - REV002